

WHAT IS CLAIMED IS

1. A connector that includes a frame with a contact-holding passage, a contact lying in said passage, and a wire that has a conductor and a wire insulator lying around the conductor except at a bared conductor end, said contact being formed of a single piece of sheet metal and having a contact termination end that is terminated to the wire, a contact mating end for contacting to a mating contact device, and a contact middle mounted in the frame, wherein:

said termination end of the contact includes a wide groove part with a wide groove middle that has a wide groove bottom that receives the insulation, said wide groove part including a pair of wide groove part wings projecting from the wide groove part middle and crimped around the wire insulation;

said termination end of the contact also includes a narrow groove part having a narrow groove middle that has a narrow groove bottom that is offset from said wide groove bottom, said narrow groove bottom receiving the bared conductor, said narrow groove part having a pair of narrow groove part wings projecting from the narrow groove part middle and crimped around the bare conductor.

2. The connector described in claim 1 wherein said frame has a frame front face and said contact-holding passage opens to said frame front face, said contact mating end forms a resilient end beam with a beam inner end connected by an inner bend to the rest of the contact, with a beam middle extending from said beam inner end at an incline away from said frame face, and with a beam free outer portion extending from an outer end of said beam middle that is opposite said beam inner end, wherein:

said free beam outer portion extends at an angle (C) of less than 135° to said beam middle, as measured at the inside of said bend.

3. The connector described in claim 1 wherein said frame has a frame front face and said contact-holding passage opens to said frame front face, said contact mating end forms a resilient end beam with a beam inner end connected by an inner bend to a rest of the contact, with a beam middle extending from said beam inner end and having an outer part extending at an incline away from said frame face, and with a beam free outer portion extending from an outer end of said beam middle that is opposite said beam inner end, wherein:

said beam free outer portion forms a spherical bump, to thereby obtain largely point contact with a flat surface lying parallel to and adjacent to, said frame front face.

4. The connector described in claim 1 including a plurality of frame devices that include said frame, and including:

a housing that has a plurality of tunnels including a small tunnel and a large tunnel, the large tunnel having a larger cross-section than the small tunnel;

said plurality of frame devices includes a small frame that fits closely in said small tunnel and a large frame that fits closely in said large tunnel but not said small tunnel, each frame device having a frame front face;

each of said frame devices has front and rear ends and a plurality of passages extending between said ends, said passages each having a height that is a plurality of times as great as its width;

a multiplicity of contact elements including said contact, each contact element lying in one of said passages, said multiplicity of contact elements includes a plurality of small contact elements each lying in one of said small passages and a plurality of large contact each lying in one of said large passages;

each of said contact elements has a contact major portion and has a

resilient end beam with a beam inner end connected by an inner bend to the contact major portion and each end beam extending from its inner bend and having an outer portion extending at an incline away from the frame face

the end beams of said large contacts have a cross-section that is at least 150% as large as the end beams of said small contacts; whereby the large contacts can be power contacts that carry large currents with minimal heating while the small contacts carry low current signals.

5. The connector described in claim 4 wherein:

each of end beams has an outer end that forms a contact location, and said large contacts each has a thickness along its end beam that is at least 120% of the thickness of said small contacts along their end beams, each end beam having a width that is greater than its thickness.

6. The connector described in claim 5 wherein:

each of said large passages has a greater height than said small passages, and each of said large contacts has an end beam of greater height than the height of the end beams of said small contacts.

7. A connector that includes a frame having a through passage and a frame front face, the connector including a contact lying in the passage, said contact being formed of a piece of sheet metal, said contact having a main contact portion and having a mating end portion that comprises a resilient end beam with a beam middle inner end connected by an inner bend to said main contact portion, with a beam middle extending from said beam middle inner end at an incline and forward of said frame face, and with a beam free outer portion having a part lying forward of said frame face and extending from an outer end of said beam middle

that is opposite said beam inner end, wherein:

10        said beam middle has an outer part that forms a convex bump that is curved about two perpendicular axes that each extends primarily parallel to said frame front face, with a radius of curvature about each axis being no more than four times the thickness of the sheet metal along said end beam.

8.    The connector described in claim 7 wherein:

      said beam free outer portion extends from an outer end of said beam middle that is opposite said beam inner end, in a bend that has a bend angle of less than  $135^\circ$  as measured at the inside of the bend.

9.    The connector described in claim 7 including a wire that has a conductor and an insulator around the conductor except at a bared conductor end, and wherein:

5        said contact has a termination end that lies opposite said mating end, said termination end having a wide groove part with a wide groove middle that has a wide groove bottom that receives the insulation, and said wide groove part including a pair of wide groove part wings projecting from the wide groove part middle and crimped around the wire insulation;

10        said termination end of the contact includes a narrow groove part having a narrow groove middle that has a narrow groove bottom that is offset from said wide groove bottom, said narrow groove bottom receiving the bared conductor, and said narrow groove part having a pair of narrow groove part wings projecting from the narrow groove part middle and crimped around the bared wire.

10.    A connector that includes a frame having a through passage and a frame front face, the connector including a contact lying in the passage, said

contact being formed of a piece of sheet metal, said contact having a main contact portion and having a mating end portion that comprises a resilient end beam with  
5 a beam middle inner end connected by an inner bend to said main contact portion, with a beam middle extending from said beam middle inner end at an incline and forward of said frame face and a beam free outer portion lying forward of said frame face and extending from an outer end of said beam middle that is opposite  
10 said beam inner end, wherein:

10       said beam free outer portion extends from an outer end of said beam middle that is opposite said beam middle inner end, in a bend that has a bend angle of less than 135° as measured at the inside of the bend..

11.   The connector described in claim 10 wherein:

      said beam free outer portion has a tip lying furthest from said outer end of said beam middle, said tip lying in said passage when said end beam is not deflected.